

Abstract

We propose a precision extraction of the neutron spin structure function g_1^n and the virtual photon asymmetry A_1^n in the resonance region over a moderate Q^2 range (up to $Q^2 = 5.4(\text{GeV}/c)^2$) using a polarized ^3He target. The Bloom-Gilman duality has been experimentally demonstrated for the spin independent structure functions of the proton down to small values of Q^2 . The proposed experiment combined with Deep-Inelastic-Scattering data will provide a precision test of quark-hadron duality predictions for neutron spin structure functions. The demonstration of duality for spin structure functions will enable the use of resonance data as a powerful tool to study the nucleon spin structure in the very high x region.